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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/542,493

Applicant(s)

STRAND ET AL.

Examiner

GURPREET KAUR

Art Unit

1759

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3 and 20-42 is/are pending in the application.
- 4a) Of the above claim(s) 3 and 36-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-35 and 39-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-940)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Status of the Claims

1. Claims 3 and 20-42 are pending in the application.
Claims 3, and 36-38 are withdrawn and 1, 2, 4-19 and 43-97 are cancelled.
Claims 20-35 and 39-42 are being examined in the application.

Status of the Rejection

2. New grounds of rejection under 35 USC 103(a) are necessitated by the amendments.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 20 recites the limitation "the isoelectric point" in line 1 and "the pH" in line

4. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
3. Claim 20, 22, 27-32 and 39-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (Capillary isoelectric focusing with a Universal Concentration Gradient Imaging System Using a Charge-Coupled Photodiode Array, Anal. Chem. 1992, 64, 2934-2941) in view of Ivory et al. (US Pat. No. 6,277,258) and as evidenced by Luner et al. (U.S. Pat. No. 3,664,939)

Regarding claim 20, Wu et al. teaches the method of capillary isoelectric focusing of proteins (charged analyte) under electric field gradient (see abstract and page 2938 col. 1, paragraph 1) comprising:

protein (charge analyte) dissolved in pharmalyte injected under pressure in 3-3.5 Kv dc voltage applied to the capillary under electric field gradient to form a focused discrete zone (second stable position) in a pH range of 3-10 (change in pH) (see page 2935 col. 2, paragraph Isoelectric Focusing Process and page 2939 col. 2, II. 1-2)

Wu further teaches obtaining the positions and pI values of the zones or focused proteins (see Table 1 and figure 9) which are within electric field.

Wu et al. teaches but does not specifically teach determining the pH of flowing liquid to determine the isoelectric point. However, it is well known in the art of isoelectric focusing that isoelectric point of the protein or charged particle is the pH of the liquid where the net electrical charge of the protein is zero and that is isoelectric point of the protein.

Moreover, Luner et al. teaches the method of determining the pH value of the liquid to determine the isoelectric point of the proteins (see abstract and col. 2, lines 17-21 and col. 1, lines 29-40).

Wu et al. teaches applying pressure to introduce the sample into the capillary but does not explicitly teach focusing the charged particles in the flowing liquid at a first stable position.

However, Ivory et al. teaches the method for focusing a charged solute (first stable position) in a fluid medium and applying hydrodynamic force and opposing electric field causes solute focusing and separation of the proteins (see col. 3, ll. 15-35).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate the step of focusing the solute at a stable position of Ivory et al. as a sample preparation step with the method of Wu et al. because the step allows concentrating the sample from a diluted sample prior to separation which would enhance separation.

4. Regarding claim 22, Wu teaches proteins are focused in a pH range of 3-10 (see page 2939 col. 2, ll. 1-2). Wu does not explicitly indicate if the pH is incremented above

or below the isoelectric point. However, it would be obvious to increment the pH accordingly to move the charged analyte.

5. Regarding claims 29-32, Wu et al. teaches charged analytes are proteins (biomacromolecule) (see page 2939 col. 2, ll. 1-2) and protein inherently has multiple charged analytes. Wu does not teach explicitly teaches DNA as biomacromolecule, however it would be obvious DNA is well known in art and is considered to be a biomacromolecule and thus Wu's method can be applied to separate DNA samples.

6. Regarding claim 27, Ivory et al. teaches the charged solute is focused in DFGF chamber (10) (see col.13, lines 20-23).

7. Regarding claim 28, Ivory et al. teaches that DFGF chamber comprises a separation chamber (12) (see figure 1) which comprises chromatography media (see col. 9, lines 5-16) and under applied electric field gradient the protein bands focused, separated and eluted from the device (see col. 7, lines 1-7).

8. Regarding claims 39 and 40, Wu et al. teaches proteins are focused under electric field gradient focusing (EFGF) in agarose gel with ampholytes (see page 2935, col. 1, paragraph Isoelectric Focusing Process). It is obvious to person of ordinary skill in the art EFGF occurs in a capillary (chamber).

9. Regarding claims 41 and 42, Ivory teaches the charged solute is focused in device (10) comprised of configured electrode chamber (14) and separation chamber (12) (see figure 1).

10. Claims 21, 24, 26, 33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu, Ivory and Luner, and further in view of Yang et al. (U.S. Pat. No. 4,666,855).

Regarding claim 21, Wu et al. in view of Ivory and Luner et al. does not teach isoelectric point is determined by extrapolation.

However, Yang et al. teaches the method of determining isoelectric point of an amphometric molecule comprising (see col. 3, lines 13-16) the step of extrapolating the profile to determine the isoelectric point which are in excellent agreement with the literature value (see col. 10, lines 10-15).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate the extrapolating step of Yang et al. with the method of Wu because extrapolating step provided excellent isoelectric point value when compared with literature value (see Yang, col. 10, lines 10-15).

11. Regarding claims 24, 26 and 35, Wu teaches proteins are focused in a pH range of 3-10 (see page 2939 col. 2, ll. 1-2).

Wu et al. in view of Ivory and Luner does not teach pH of the flowing liquid is changed in increments and isoelectric point is calculated by averaging the upper

bracket pH and lower bracket pH or mixing known amount/pH of titrating solution to known of flowing liquid of known pH .

However Yang et al. teach the method of determining the isoelectric point of an amphoteric molecule (see col. 3, lines 13-16) comprising the step of changing (incrementing) the pH above of the isoelectric point to the below of the isoelectric point by combining known pH values of test solution with known pH value of teast suspensions at various pH values to obtain higher and lower plateau (see figure 1) and isoelectric point is determined by averaging the higher and lower bracketing absorbance at the corresponding pH (see Table 1).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate the method of determining the isoelectric point of Yang et al. with the Wu method allows to calculate the isoelectric point in any type of buffer system (see Yang, col. 4, lines 17-19).

12. Regarding claim 33, Wu et al. teaches a CCD (detector) to detect the bands (see page 2935 col. 1, paragraph 1).

13. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu, Ivory, Luner and further in view of Malabarba et al. (U.S. Pat. No. 5,521,155).

Regarding claim 23, Wu et al. in view of Ivory and Luner does not teach that isoelectric point is determined by interpolation.

However, Malabarba et al. teaches that isoelectric point of each antibiotic was determined by interpolation on a curve (see col. 51, lines 35-45).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to include the interpolation step of Malabarba et al. with the Wu method because interpolation method is known to be used to determine isoelectric point (see Malabarba col. 51, lines 35-45).

14. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. in view of Ivory and Luner and further in view of Zhu et al. (U.S. Pat. No. 5,110,434).

Regarding claim 25, Wu does teach pH range of 3-10 of ampholytes used to separate proteins.

Wu et al. in view of Ivory and Luner are silent to titrating the ampholyte with dialyzing ions.

However, Zhu et al. teaches titrating the anolyte and catholyte with zwitterions (dialyzing ions) to a fixed pH (see col. 5, lines 20-34 and 39-44).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate the zwitterions mobilization method of Zhu et al. with Wu method because zwitterions mobilization method provides continuous expanding zone in the medium which prevents broadening of late-migrating and slow-moving peaks (see Zhu, col. 2, lines 50-53 and 28-30).

15. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu, Ivory, Luner and further in view of Ness et al. (U.S. Pat. No. 6,613,508).

Regarding claim 34, Wu, Ivory and Luner does not specifically indicated the sample is split before being focused and incremented.

However, Ness et al. teaches the sample splitter which splits the sample into fractions for further analysis or storage (see col. 84, lines 18-23).

Moreover, it is obvious to person of ordinary skill in the art to spilt sample into smaller volume to perform analysis at faster rate.

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate the sample splitter to split the sample of Ness et al. with the Wu method because splitting the sample into fractions for analysis can be done at faster rate.

Response to Arguments

Applicant's arguments with respect to claims 20 and subsequent dependent claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GURPREET KAUR whose telephone number is (571)270-7895. The examiner can normally be reached on Monday-Friday 9:00-5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ula C. Ruddock can be reached on (571)272-1481. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/G. K./
Examiner, Art Unit 1759

/Jeffrey T. Barton/
Supervisory Patent Examiner, Art Unit 1759
23 March 2011